

# NOTES ON ADDITIONS, CHANGES AND THE DISTRIBUTION OF THE AUSTRALIAN WATER-BUG FAUNA (HEMIPTERA-HETEROPTERA)

By I. LANSBURY

Hope Department of Entomology, University Museum, Oxford

## Introduction

By the courtesy of Mr A. Neboiss, National Museum of Victoria, Melbourne; Dr T. E. Woodward, University of Queensland; Dr T. Weir, Department of Northern Territory, Darwin; Dr I. A. E. Bayly, Monash University and Miss J. Knowles of Monash University, I have been able to study several collections of aquatic Heteroptera from various localities, principally Victoria, with smaller collections from Queensland, Fraser Island, Q., Northern Territory and Tasmania. Noteworthy is the discovery of a striking new species of *Anisops* (Notonectidae) from Northern Queensland and the confirmation of the discovery of *Cercotmetus* (Nepidae) new to the Australian fauna with a new subspecies of *brevipes* Montandon from Northern Queensland and the Northern Territory.

I wish to thank Dr A. S. Menke, United States National Museum, Washington for providing a figure of the Holotype of a little known species, *Anisops malkini* Brooks from Northern Australia. Finally, I wish to thank Dr G. Gross, South Australian Museum, Adelaide for the loan of a series of *Sigara* (*Tropocorixa*) *australis* (Fieber) which enabled me to solve an extremely puzzling problem which is dealt with in detail in these notes.

## Nepidae

*Ranatra diminuta* Montandon: Queensland, Fraser Island, Coomboo Lake, 5.i.1972, I. A. E. Bayly (I.A.E.B.) 2 ♀, 5 immature. F.I., Boomerang North, 10.i.1972, I.A.E.B., immature specimens. F.I., Hidden Lake, 8.i.1972, I.A.E.B., immature specimens. F.I., Deep Lake, 10.i.1972, I.A.E.B., immature specimens.

*Laccotrephes tristis* Stal: Queensland, Fraser Island, Coomboo Lake, 5.i.1972, I.A.E.B., 1 ♂. F.I., Wabby Lake, I.A.E.B., immature specimen. F.I., Lake Bowarrady, 7.i.1972, I.A.E.B., 1 ♀.

## *Cercotmetus brevipes australis* subsp. n.

(Figs. 1-3, 7 and 8)

Males, 36.5 mm long, respiratory siphon 8 mm long, ♀ 38 mm long, respiratory siphon 8.5 mm long.

General appearance similar to nominate form, differs in features as tabulated below:

<i>brevipes australis</i> subsp. n.	<i>brevipes brevipes</i> Montandon
Front femora not noticeably sinuate or deeply concave posteriorly (Fig. 1)	Front femora sinuate, deeply concave posteriorly (Fig. 4)
Front tibiae with two clear yellowish bands (Fig. 1)	Front tibiae mostly pale yellow (Fig. 4)
Middle femora slightly longer than median length of pronotum	Middle femora shorter than median length of pronotum
Hind femora reaching posterior margin of 5th sternite	Hind femora not reaching posterior margin of 5th sternite
Male operculum not triangular (Fig. 3)	Male operculum triangular (Fig. 6)

Male genitalia (Figs. 2, 7 and 8) typical of genus *Cercotmetus*. The bridge, basal plates and lateral arms are very long and lightly sclerotised. Lamina ventralis vestigial. Central strut large and almost hyaline. Ejaculatory reservoir elongate. Vesica partially enclosed within a rod which is quite heavily sclerotised anteriorly becoming rather more membranous distally. Posterior diverticulum simple, rather more sclerotised than the median phallotheca. Paramere (Fig. 2) similar to nominate form. Specimens of *brevipes brevipes* from Viet-Nam have slightly different parameres (Fig. 5) but do not differ in any other way from nominate form. Figure 5 is drawn from a dry mounted specimen whereas figure 2 is of a specimen which has been cleared in KOH and passed through glacial acetic acid, etc.

# NOTES ON ADDITIONS, CHANGES AND THE DISTRIBUTION OF THE AUSTRALIAN WATER-BUG FAUNA (HEMIPTERA-HETEROPTERA)

By I. LANSBURY

Hope Department of Entomology, University Museum, Oxford

## Introduction

By the courtesy of Mr A. Neboiss, National Museum of Victoria, Melbourne; Dr T. E. Woodward, University of Queensland; Dr T. Weir, Department of Northern Territory, Darwin; Dr I. A. E. Bayly, Monash University and Miss J. Knowles of Monash University, I have been able to study several collections of aquatic Heteroptera from various localities, principally Victoria, with smaller collections from Queensland, Fraser Island, Q., Northern Territory and Tasmania. Noteworthy is the discovery of a striking new species of *Anisops* (Notonectidae) from Northern Queensland and the confirmation of the discovery of *Cercotmetus* (Nepidae) new to the Australian fauna with a new subspecies of *brevipes* Montandon from Northern Queensland and the Northern Territory.

I wish to thank Dr A. S. Menke, United States National Museum, Washington for providing a figure of the Holotype of a little known species, *Anisops malkini* Brooks from Northern Australia. Finally, I wish to thank Dr G. Gross, South Australian Museum, Adelaide for the loan of a series of *Sigara* (*Tropocorixa*) *australis* (Fieber) which enabled me to solve an extremely puzzling problem which is dealt with in detail in these notes.

## Nepidae

*Ranatra diminuta* Montandon: Queensland, Fraser Island, Coomboo Lake, 5.i.1972, I. A. E. Bayly (I.A.E.B.) 2 ♀, 5 immature. F.I., Boomerang North, 10.i.1972, I.A.E.B., immature specimens. F.I., Hidden Lake, 8.i.1972, I.A.E.B., immature specimens. F.I., Deep Lake, 10.i.1972, I.A.E.B., immature specimens.

*Laccotrephes tristis* Stal: Queensland, Fraser Island, Coomboo Lake, 5.i.1972, I.A.E.B., 1 ♂. F.I., Wabby Lake, I.A.E.B., immature specimen. F.I., Lake Bowarrady, 7.i.1972, I.A.E.B., 1 ♀.

## *Cercotmetus brevipes australis* subsp. n.

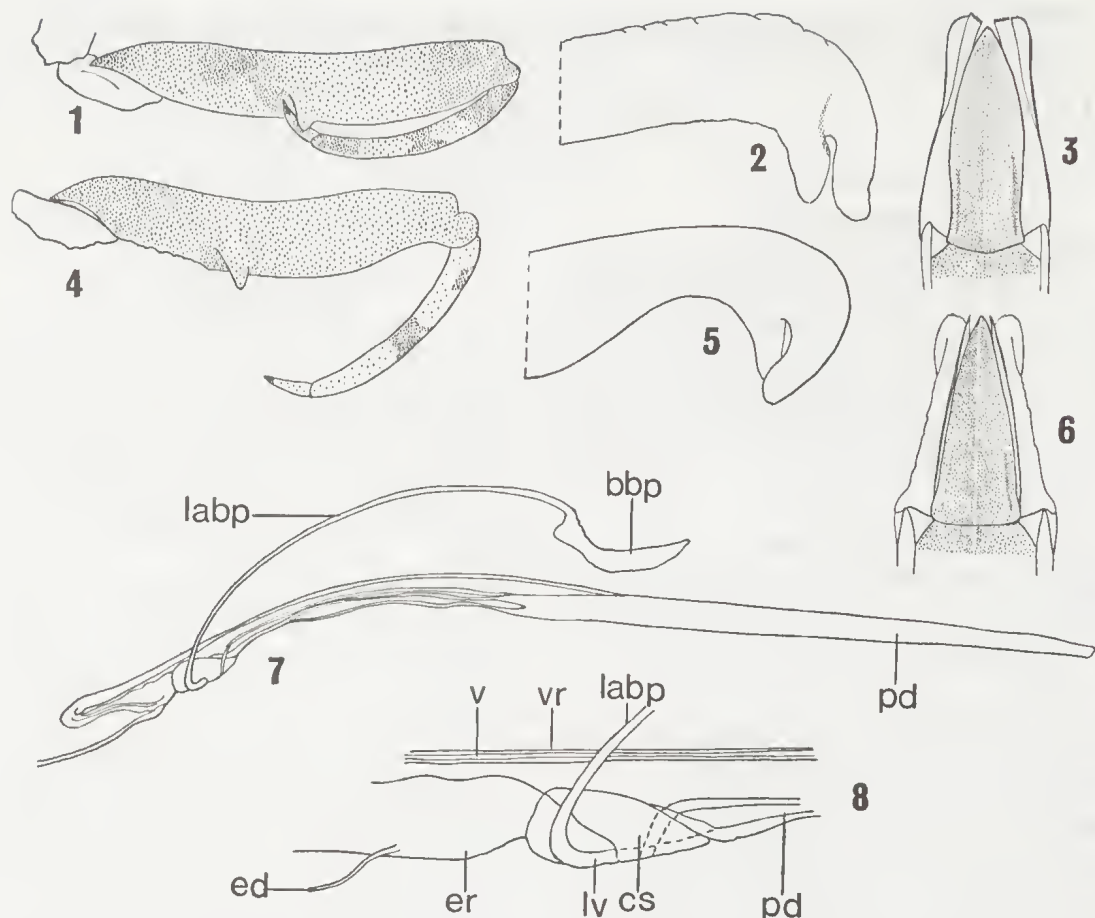
(Figs. 1-3, 7 and 8)

Males, 36.5 mm long, respiratory siphon 8 mm long, ♀ 38 mm long, respiratory siphon 8.5 mm long.

General appearance similar to nominate form, differs in features as tabulated below:

<i>brevipes australis</i> subsp. n.	<i>brevipes brevipes</i> Montandon
Front femora not noticeably sinuate or deeply concave posteriorly (Fig. 1)	Front femora sinuate, deeply concave posteriorly (Fig. 4)
Front tibiae with two clear yellowish bands (Fig. 1)	Front tibiae mostly pale yellow (Fig. 4)
Middle femora slightly longer than median length of pronotum	Middle femora shorter than median length of pronotum
Hind femora reaching posterior margin of 5th sternite	Hind femora not reaching posterior margin of 5th sternite
Male operculum not triangular (Fig. 3)	Male operculum triangular (Fig. 6)

Male genitalia (Figs. 2, 7 and 8) typical of genus *Cercotmetus*. The bridge, basal plates and lateral arms are very long and lightly sclerotised. Lamina ventralis vestigial. Central strut large and almost hyaline. Ejaculatory reservoir elongate. Vesica partially enclosed within a rod which is quite heavily sclerotised anteriorly becoming rather more membranous distally. Posterior diverticulum simple, rather more sclerotised than the median phallotheca. Paramere (Fig. 2) similar to nominate form. Specimens of *brevipes brevipes* from Viet-Nam have slightly different parameres (Fig. 5) but do not differ in any other way from nominate form. Figure 5 is drawn from a dry mounted specimen whereas figure 2 is of a specimen which has been cleared in KOH and passed through glacial acetic acid, etc.



Figs. 1-3, 7 and 8 *Cercotmetus brevipes australis* subsp. n. ♂: 1, front leg. 2, paramere. 3, operculum. 7, internal genitalia: bbp bridge and basal plates; cs central strut; ed ejaculatory duct; er ejaculatory reservoir; labp lateral arms of the basal plates; lv lamina ventralis; pd posterior diverticulum; v vesica; vr vesical rod. 8, detailed view of central strut and associated structures. Figs. 4-6 *Cercotmetus brevipes brevipes* Montandon ♂: 4, front leg. 5, paramere. 6, operculum.

Holotype ♂, Australia, Northern Territory, 12°16' S-133°13' E, Birraduk Creek, 16 km W. by SW. of Nimbuwah Rock, 4.vi.1973, T. Weir in the collection of the Department of Northern Territory, Darwin.

Paratypes: 1 ♂, Northern Territory, 12°06' S-133°04' E, Cooper Creek, 19 km E. by S. of Mt. Borrodaile, 5.vi.1973, T. Weir, Oxford.

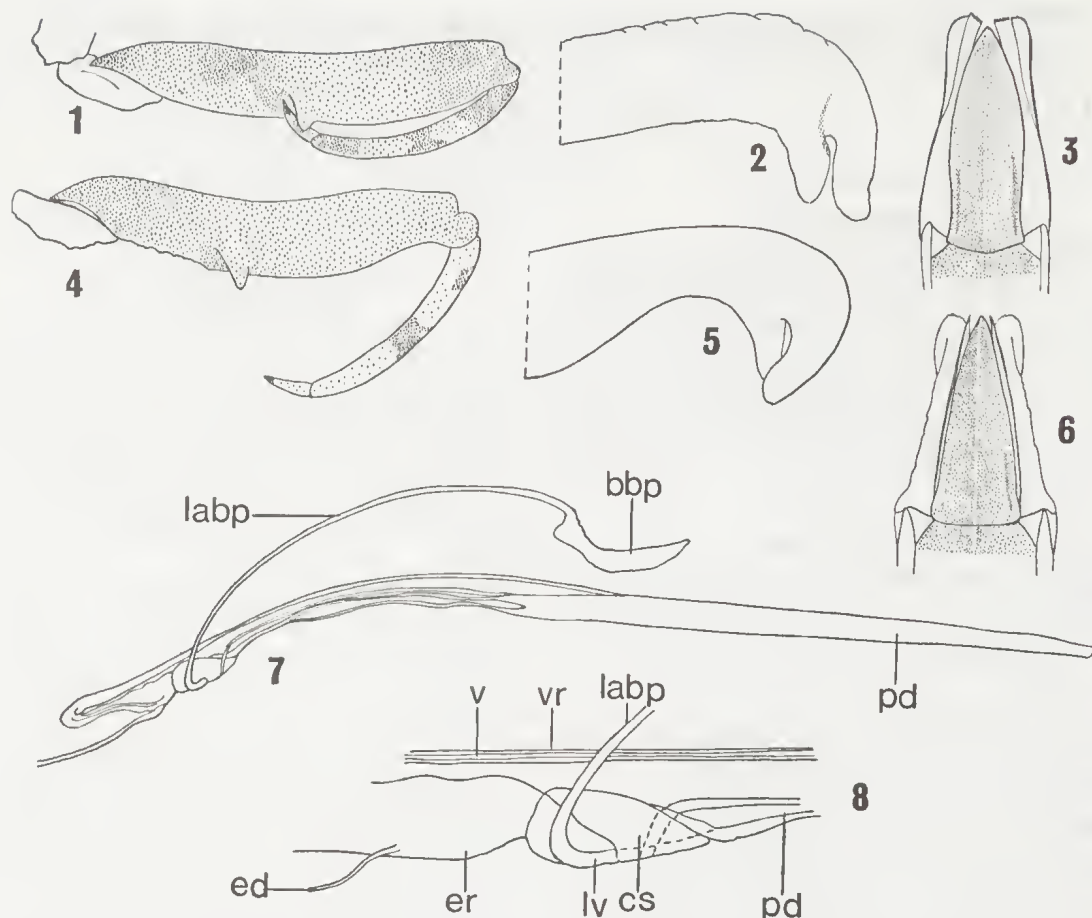
1 ♂, Northern Territory, Berry Springs, 64 km south of Darwin, 28.x.1970, T. Weir, Queensland University Collection.

In addition to the three adults listed, the following immature specimens of *brevipes australis* have been examined:

Two immature: Northern Territory, 12°17' S-133°20' E, Cooper Creek, 11 km S. by W. of Nimbuwah Rock, 3.vi.1973, T. Weir, Department of Northern Territory, Darwin. One immature: North Queensland, Hann River, 80 km north of Laura, 26.x.1969, B. Cantrell, Queensland University Collection.

In a footnote Lansbury (1973) refers to an immature *Cercotmetus* from Australia, Groote Eyland, 5.vi.1948, R. R. Miller as being either a new species or *dissidens* Montandon so far only known from New Guinea. It is thought likely that this specimen may be referable to *brevipes australis*. The nominate form has a very wide distribution: Sumatra, Java, Sarawak, India (Bengal), Thailand, Viet-Nam, Philippines and China (Fukien). Lansbury (1973)





Figs. 1-3, 7 and 8 *Cercotmetus brevipes australis* subsp. n. ♂: 1, front leg. 2, paramere. 3, operculum. 7, internal genitalia: bbp bridge and basal plates; cs central strut; ed ejaculatory duct; er ejaculatory reservoir; labp lateral arms of the basal plates; lv lamina ventralis; pd posterior diverticulum; v vesica; vr vesical rod. 8, detailed view of central strut and associated structures. Figs. 4-6 *Cercotmetus brevipes brevipes* Montandon ♂: 4, front leg. 5, paramere. 6, operculum.

Holotype ♂, Australia, Northern Territory, 12°16' S-133°13' E, Birraduk Creek, 16 km W. by SW. of Nimbuwah Rock, 4.vi.1973, T. Weir in the collection of the Department of Northern Territory, Darwin.

Paratypes: 1 ♂, Northern Territory, 12°06' S-133°04' E, Cooper Creek, 19 km E. by S. of Mt. Borrodaile, 5.vi.1973, T. Weir, Oxford.

1 ♂, Northern Territory, Berry Springs, 64 km south of Darwin, 28.x.1970, T. Weir, Queensland University Collection.

In addition to the three adults listed, the following immature specimens of *brevipes australis* have been examined:

Two immature: Northern Territory, 12°17' S-133°20' E, Cooper Creek, 11 km S. by W. of Nimbuwah Rock, 3.vi.1973, T. Weir, Department of Northern Territory, Darwin. One immature: North Queensland, Hann River, 80 km north of Laura, 26.x.1969, B. Cantrell, Queensland University Collection.

In a footnote Lansbury (1973) refers to an immature *Cercotmetus* from Australia, Groote Eyland, 5.vi.1948, R. R. Miller as being either a new species or *dissidens* Montandon so far only known from New Guinea. It is thought likely that this specimen may be referable to *brevipes australis*. The nominate form has a very wide distribution: Sumatra, Java, Sarawak, India (Bengal), Thailand, Viet-Nam, Philippines and China (Fukien). Lansbury (1973)

synonymised *C. formosanus* Sonan from Formosa with *brevipes*.

In Lansbury (1973) *brevipes australis* does not key correctly, the key should be amended as follows:

- 2 (1) Not more than 42 mm long . . . . . 2A
- More than 47 mm long . . . . . 3
- 2A (2) Middle femora clearly shorter than the median length of the pronotum, front femora sinuate . . . *brevipes brevipes* Montandon.
- Middle femora longer than the median length of the pronotum, front femora not noticeably sinuate . . . *brevipes australis* subsp. n.

### Notonectidae

*Anisops nasuta* Fieber: Queensland, Fraser Island, Boomerang South, 9.i.1972, I.A.E.B., 1 ♀, F.I., Basin Lake, I.A.E.B., 1 ♂, 15 ♀ 1 immature.

*Anisops elstoni* Brooks: Queensland, Fraser Island, AB Lake, 10.i.1972, I.A.E.B. 4 ♂, 8 ♀.

*Anisops gratus* Hale: Victoria, Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 23.iv.1971, J. Knowles (J.K.) 2 ♂.

*Anisops deanei* Brooks: Victoria, Jaractnear Lake, 5.ix.1971, -Hang, 1 ♂. Queensland, Creek on Esk road near Ipswich Junction, 22.v.1971, J.K., 1 ♂.

*Anisops evansi* Brooks: Victoria, Lake Struan, 26.vi.1971, J.K., 8 ♂, 7 ♀. Not previously recorded from the mainland of Australia and thought to be a Tasmanian endemic.

*Anisops barrensis* Brooks: Queensland, Creek on Esk road near Ipswich Junction, 22.v.1971, J.K., 1 ♂. This specimen does not agree in some important details with paratypes of *barrensis*.

*Anisops thienemanni* Lundblad: New South Wales, Lagoon next to Lake Victoria, 8.iv.1971, J.K.; 8 ♂, 9 ♀. Victoria, Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 23.iv.1971, J.K., 2 ♂, 2 ♀. Little Lake next to Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 25.iv.1971, J.K., 6 ♂, 2 ♀. Dam near Lake Murdeduke, 26.vi.1971, J.K., 4 ♀. Lake Purrumbete, Camperdown, 25.iv.1971, J.K., 7 ♂, 1 ♀. Victoria,

Jaractnear Lake, 5.ix.1971, -Hang, 2 ♂, 3 ♀. Tchem Lake, 20.iii.1971, -Hang, 2 ♂, 6 ♀. Streatham "Blythvale" Billabong, 24.iv.1971, J.K., 1 ♂, 1 ♀. Streatham "Blythvale" river behind house, 24.iv.1971, J.K., 2 ♂, 2 ♀. Lake Coleman, 19.vi.1971, B. Chessman, 3 ♂, 7 ♀. Lake Struan, 26.vi.1971, J.K., 1 ♂, 1 ♀.

### *Anisops planifacies* sp. n.

(Figs. 9-12)

Male 8.3 mm long, maximum width 2.5 mm, ♀ 8.9 mm long, maximum width 2.75 mm. Colour and structure ♂: Eyes dark brown. Pronotum, scutellum and most of the abdomen pale yellowish. Elytra hyaline. Posterior tergites and sternites black. Epimeron reddish brown.

Viewed from above, the anterior margin of the head is straight. Greatest width of head three-fourths pronotal humeral width and six times the anterior width of the vertex. Synthipsis just over half the anterior width of the vertex. Median head length two-thirds the median pronotal length. Pronotal humeral width twice the median length, lateral margins diverging and half the median length, posterior margin broadly emarginate. Facial tubercle raised between the lower margins of the eyes forming a flat platform (Fig. 11) not visible when viewed from above. Labrum basally broader than long and rather hairy. Rostral prong large. Stridulatory comb (Fig. 10) chaetotaxy of the male front leg (Fig. 9).

Female: Eyes black, posterior margin of the pronotum and scutellum orange. Tergites black with orange bands posteriorly. Underside entirely black. Viewed from above the head is more rounded than in the male. Greatest width of head almost equalling pronotal humeral width and five and a half times the anterior width of the vertex. Median head length over half but less than two-thirds median pronotal length.

Comparative notes: This species keys out to couplet 16 (*malkini* Brooks and *occipitalis* Breddin) in Lansbury (1969). It can be distinguished from these two and all other Australian species by the raised facial tubercle. Brooks (1951) states that the frons of *malkini*

synonymised *C. formosanus* Sonan from Formosa with *brevipes*.

In Lansbury (1973) *brevipes australis* does not key correctly, the key should be amended as follows:

- 2 (1) Not more than 42 mm long . . . . . 2A
- More than 47 mm long . . . . . 3
- 2A (2) Middle femora clearly shorter than the median length of the pronotum, front femora sinuate . . . *brevipes brevipes* Montandon.
- Middle femora longer than the median length of the pronotum, front femora not noticeably sinuate . . . *brevipes australis* subsp. n.

### Notonectidae

*Anisops nasuta* Fieber: Queensland, Fraser Island, Boomerang South, 9.i.1972, I.A.E.B., 1 ♀, F.I., Basin Lake, I.A.E.B., 1 ♂, 15 ♀ 1 immature.

*Anisops elstoni* Brooks: Queensland, Fraser Island, AB Lake, 10.i.1972, I.A.E.B. 4 ♂, 8 ♀.

*Anisops gratus* Hale: Victoria, Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 23.iv.1971, J. Knowles (J.K.) 2 ♂.

*Anisops deanei* Brooks: Victoria, Jaractnear Lake, 5.ix.1971, -Hang, 1 ♂. Queensland, Creek on Esk road near Ipswich Junction, 22.v.1971, J.K., 1 ♂.

*Anisops evansi* Brooks: Victoria, Lake Struan, 26.vi.1971, J.K., 8 ♂, 7 ♀. Not previously recorded from the mainland of Australia and thought to be a Tasmanian endemic.

*Anisops barrensis* Brooks: Queensland, Creek on Esk road near Ipswich Junction, 22.v.1971, J.K., 1 ♂. This specimen does not agree in some important details with paratypes of *barrensis*.

*Anisops thienemanni* Lundblad: New South Wales, Lagoon next to Lake Victoria, 8.iv.1971, J.K.; 8 ♂, 9 ♀. Victoria, Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 23.iv.1971, J.K., 2 ♂, 2 ♀. Little Lake next to Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 25.iv.1971, J.K., 6 ♂, 2 ♀. Dam near Lake Murdeduke, 26.vi.1971, J.K., 4 ♀. Lake Purrumbete, Camperdown, 25.iv.1971, J.K., 7 ♂, 1 ♀. Victoria,

Jaractnear Lake, 5.ix.1971, -Hang, 2 ♂, 3 ♀. Tchem Lake, 20.iii.1971, -Hang, 2 ♂, 6 ♀. Streatham "Blythvale" Billabong, 24.iv.1971, J.K., 1 ♂, 1 ♀. Streatham "Blythvale" river behind house, 24.iv.1971, J.K., 2 ♂, 2 ♀. Lake Coleman, 19.vi.1971, B. Chessman, 3 ♂, 7 ♀. Lake Struan, 26.vi.1971, J.K., 1 ♂, 1 ♀.

### *Anisops planifacies* sp. n.

(Figs. 9-12)

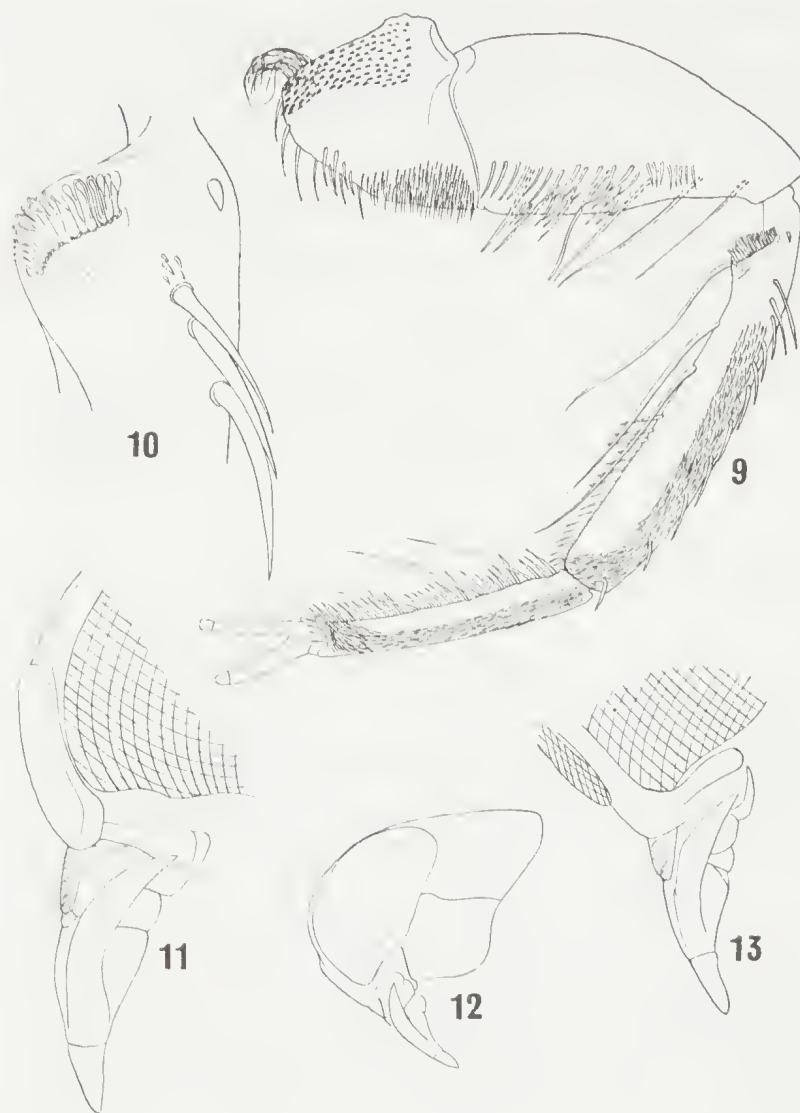
Male 8.3 mm long, maximum width 2.5 mm, ♀ 8.9 mm long, maximum width 2.75 mm. Colour and structure ♂: Eyes dark brown. Pronotum, scutellum and most of the abdomen pale yellowish. Elytra hyaline. Posterior tergites and sternites black. Epimeron reddish brown.

Viewed from above, the anterior margin of the head is straight. Greatest width of head three-fourths pronotal humeral width and six times the anterior width of the vertex. Synthipsis just over half the anterior width of the vertex. Median head length two-thirds the median pronotal length. Pronotal humeral width twice the median length, lateral margins diverging and half the median length, posterior margin broadly emarginate. Facial tubercle raised between the lower margins of the eyes forming a flat platform (Fig. 11) not visible when viewed from above. Labrum basally broader than long and rather hairy. Rostral prong large. Stridulatory comb (Fig. 10) chaetotaxy of the male front leg (Fig. 9).

Female: Eyes black, posterior margin of the pronotum and scutellum orange. Tergites black with orange bands posteriorly. Underside entirely black. Viewed from above the head is more rounded than in the male. Greatest width of head almost equalling pronotal humeral width and five and a half times the anterior width of the vertex. Median head length over half but less than two-thirds median pronotal length.

Comparative notes: This species keys out to couplet 16 (*malkini* Brooks and *occipitalis* Breddin) in Lansbury (1969). It can be distinguished from these two and all other Australian species by the raised facial tubercle. Brooks (1951) states that the frons of *malkini*





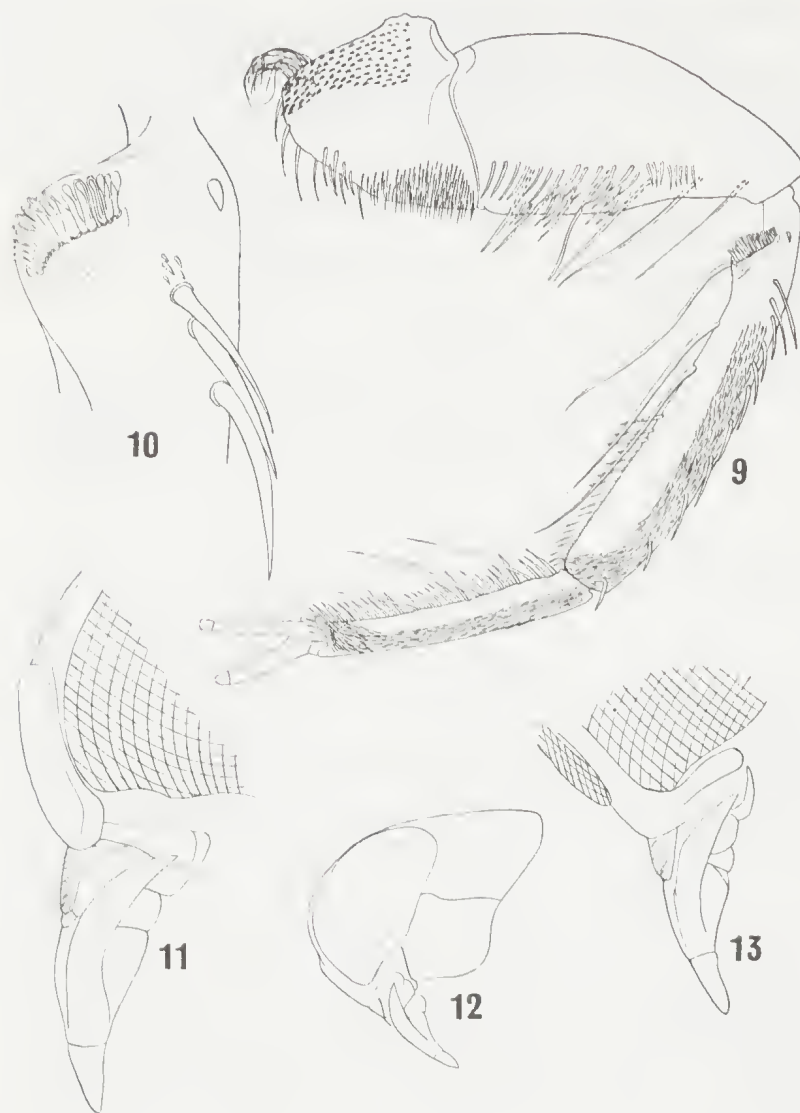
Figs. 9-12 *Anisops planifacies* sp. n. ♂: 9, front leg. 10, stridulatory comb. 11, oblique view of rostrum and rostral prong. 12, side view of head and pronotum. Fig. 13 *Anisops malkini* Brooks Holotype ♂: oblique view of rostrum and rostral prong.

are depressed and apically terminated by a transverse ridge. Dr Menke provided me with a sketch of the rostral prong and associated area of the Holotype of *malkini* described from a single male from Darwin (Fig. 13). It does not seem to be as Brooks described it, but does closely resemble *malkini* Brooks sensu Lansbury (1969) the description being based on a single male from Ord River, Western Australia. The chaetotaxy of the male front legs are all rather similar except that the male from the Ord River has four prominent spines on the

inner surface of the front tarsi which are lacking in the Holotypes of *malkini* and *planifacies*. Finally *malkini* from Darwin is 6.9 mm long compared with 7.5 mm from Western Australia, *planifacies* is much larger.

Holotype ♂ (T-4569) and allotype ♀ (T-4570), Australia, North Queensland, Hann River, 112 km south of Coen, 27.vi.1970, J. C. le Souef in the National Museum of Victoria, Melbourne.

*Enithares woodwardi* Lansbury: Queensland, Fraser Island, Boomcrang South, 9.i.1972,



Figs. 9-12 *Anisops planifacies* sp. n. ♂: 9, front leg. 10, stridulatory comb. 11, oblique view of rostrum and rostral prong. 12, side view of head and pronotum. Fig. 13 *Anisops malkini* Brooks Holotype ♂: oblique view of rostrum and rostral prong.

are depressed and apically terminated by a transverse ridge. Dr Menke provided me with a sketch of the rostral prong and associated area of the Holotype of *malkini* described from a single male from Darwin (Fig. 13). It does not seem to be as Brooks described it, but does closely resemble *malkini* Brooks sensu Lansbury (1969) the description being based on a single male from Ord River, Western Australia. The chaetotaxy of the male front legs are all rather similar except that the male from the Ord River has four prominent spines on the

inner surface of the front tarsi which are lacking in the Holotypes of *malkini* and *planifacies*. Finally *malkini* from Darwin is 6.9 mm long compared with 7.5 mm from Western Australia, *planifacies* is much larger.

Holotype ♂ (T-4569) and allotype ♀ (T-4570), Australia, North Queensland, Hann River, 112 km south of Coen, 27.vi.1970, J. C. le Souef in the National Museum of Victoria, Melbourne.

*Enithares woodwardi* Lansbury: Queensland, Fraser Island, Boomcrang South, 9.i.1972,



I.A.E.B., 1 ♀, 1 immature. F.I., AB Lake, 10.i.1972, I.A.E.B., 1 ♂, 1 ♀. Creek on Esk road near Ipswich Junction, 22.v.1971, J.K., 1 ♂. Victoria, Little Lake next to Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 25.iv.1971, J.K., 2 ♂, 3 ♀. Home Station Creek, Delatite, 25.viii.1971, H. B. Hynes, 1 ♂, 5 ♀. Streatham, "Blythvale" Billabong, 24.iv.1971, J.K., 1 ♂, 1 ♀. Streatham, "Blythvale" river behind house, 24.iv.1971, J.K., 1 ♂.

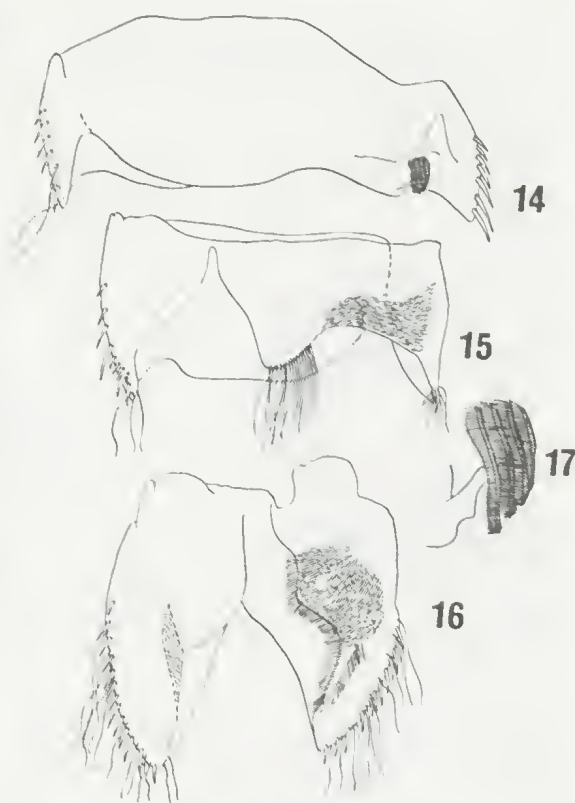
*Enithares hackeri* Hungerford: Queensland, Creek on Esk road near Ipswich Junction, 22.v.1971, J.K., 4 ♂, 3 ♀. This species is now known to occur in New Guinea (Lansbury, in press), 1 ♂, 2 ♀ have been studied from Madang District, Finisterre Mts., Moro 5,500' St. 7, 30.x.-15.xi.1964, M. E. Baeckus (British Museum, Natural-History).

### Corixidae

*Agraptocorixa hirtifrons* (Hale): Victoria, Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 23.iv.1971, J.K., 1 ♂. Lake Coragulac, Alvie, 25.iv.1971, J.K., 1 ♀. Lake Linlithgow, 24.x.1971, B. Chessman, 2 ♀. Lake Muirhead, 24.x.1971, B. Chessman, 1 ♀.

*Agraptocorixa parvipunctata* (Hale): New South Wales, Lagoon next to Lake Victoria, 8.iv.1971, J.K., 2 ♂, 4 ♀. Victoria, Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 23.iv.1971, J.K., 1 ♀. Little Lake next to Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 25.iv.1971, J.K., 1 ♂. Lake Muirhead, 24.x.1971, B. Chessman, 2 ♀.

*Agraptocorixa eurynome* (Kirkaldy): New South Wales, Lagoon next to Lake Victoria, 8.iv.1971, J.K., 1 ♀. Victoria, Little Lake next to Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 25.iv.1971, J.K., 1 ♂, 1 ♀. Dam near Lake Murdeduke, 26.vi.-1971, J.K., 5 ♂. Lake Purrumbete Camperdown, 25.iv.1971, J.K., 1 ♂. Tehem Lake, 20.viii.1971, -Hang, 6 ♂, 6 ♀. Streatham, "Blythvale" river behind house, 24.iv.1971, J.K., 2 ♂, 4 ♀ and 8 immature. Lake Coleman, 19.vi.1971, B. Chessman, 1 ♀. Lake Clarke, 23.x.1971, B. Chessman, 1 ♂. Lake Muirhead,



Figs. 14-17 *Sigara (Tropocorixa) australis* (Fieber) ♂, Adelaide: 14-16 tergites 6-8, 17, "strigil".

24.x.1971, B. Chessman, 4 ♀. Streatham, "Blythvale" Billabong, 24.iv.1971, J.K., 1 ♀. *Sigara (Tropocorixa) truncatipala* (Hale): New South Wales, Lagoon next to Lake Victoria, 8.iv.1971, J.K., 1 ♂. Queensland, Creek on Esk road near Ipswich Junction, 22.v.1971, J.K., 2 ♂.

*Sigara (Tropocorixa) sublaevifrons* (Hale): New South Wales, Lagoon next to Lake Victoria, 8.iv.1971, J.K., 1 ♂. Victoria, Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 23.iv.1971, J.K., 1 ♂. Little Lake next to Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 25.iv.1971, J.K., 1 ♂, 1 ♀. Streatham, small Dam at "Blythvale", 24.iv.1971, J.K., 1 ♂, 1 ♀. Streatham, "Blythvale" river behind house, 24.iv.1971, J.K., 2 ♂, 11 ♀. Streatham, "Blythvale" Billabong, 24.iv.1971, J.K., 5 ♂, 21 ♀. Streatham, "Blythvale" water-tank Nixon,

I.A.E.B., 1 ♀, 1 immature. F.I., AB Lake, 10.i.1972, I.A.E.B., 1 ♂, 1 ♀. Creek on Esk road near Ipswich Junction, 22.v.1971, J.K., 1 ♂. Victoria, Little Lake next to Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 25.iv.1971, J.K., 2 ♂, 3 ♀. Home Station Creek, Delatite, 25.viii.1971, H. B. Hynes, 1 ♂, 5 ♀. Streatham, "Blythvale" Billabong, 24.iv.1971, J.K., 1 ♂, 1 ♀. Streatham, "Blythvale" river behind house, 24.iv.1971, J.K., 1 ♂.

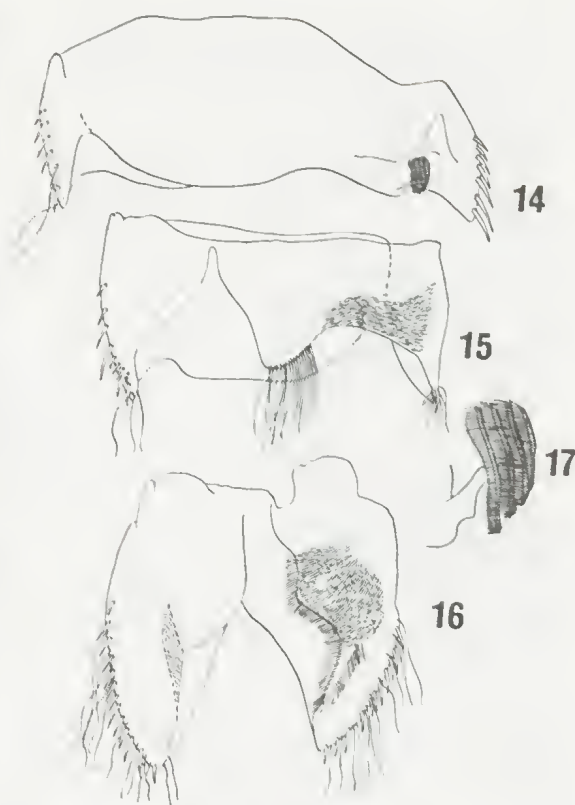
*Enithares hackeri* Hungerford: Queensland, Creek on Esk road near Ipswich Junction, 22.v.1971, J.K., 4 ♂, 3 ♀. This species is now known to occur in New Guinea (Lansbury, in press), 1 ♂, 2 ♀ have been studied from Madang District, Finisterre Mts., Moro 5,500' St. 7, 30.x.-15.xi.1964, M. E. Baeckus (British Museum, Natural-History).

### Corixidae

*Agraptocorixa hirtifrons* (Hale): Victoria, Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 23.iv.1971, J.K., 1 ♂. Lake Coragulac, Alvie, 25.iv.1971, J.K., 1 ♀. Lake Linlithgow, 24.x.1971, B. Chessman, 2 ♀. Lake Muirhead, 24.x.1971, B. Chessman, 1 ♀.

*Agraptocorixa parvipunctata* (Hale): New South Wales, Lagoon next to Lake Victoria, 8.iv.1971, J.K., 2 ♂, 4 ♀. Victoria, Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 23.iv.1971, J.K., 1 ♀. Little Lake next to Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 25.iv.1971, J.K., 1 ♂. Lake Muirhead, 24.x.1971, B. Chessman, 2 ♀.

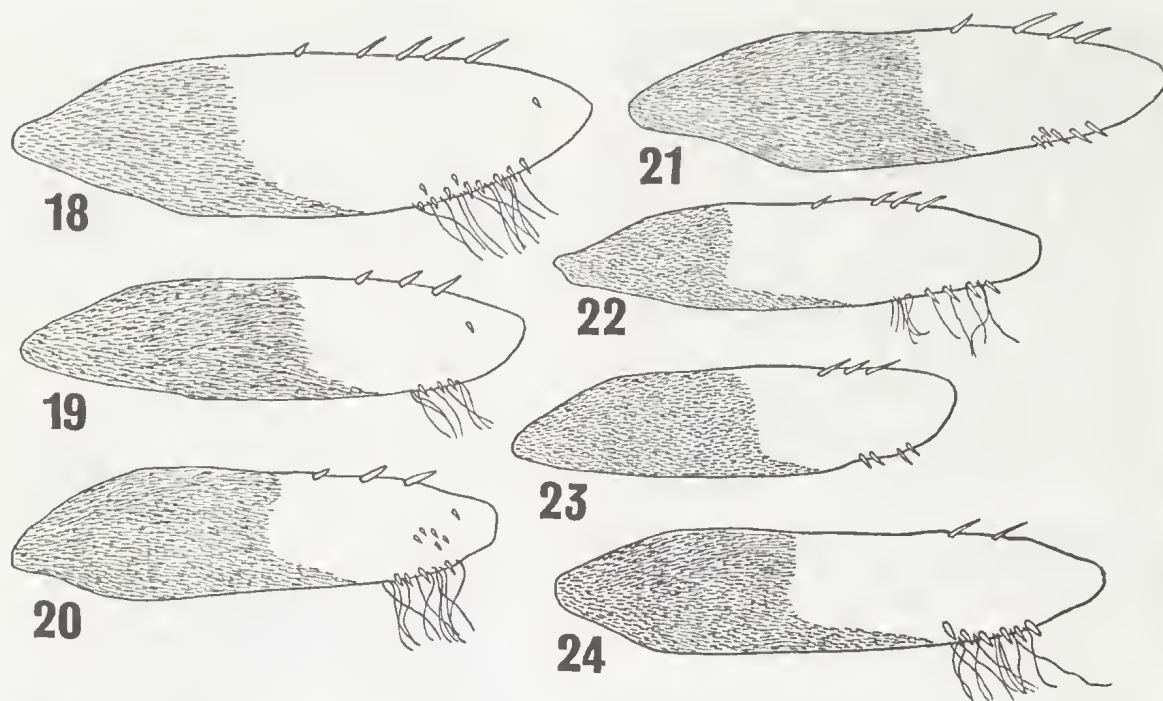
*Agraptocorixa eurynome* (Kirkaldy): New South Wales, Lagoon next to Lake Victoria, 8.iv.1971, J.K., 1 ♀. Victoria, Little Lake next to Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 25.iv.1971, J.K., 1 ♂, 1 ♀. Dam near Lake Murdeduke, 26.vi.-1971, J.K., 5 ♂. Lake Purrumbete Camperdown, 25.iv.1971, J.K., 1 ♂. Tehem Lake, 20.viii.1971, -Hang, 6 ♂, 6 ♀. Streatham, "Blythvale" river behind house, 24.iv.1971, J.K., 2 ♂, 4 ♀ and 8 immature. Lake Coleman, 19.vi.1971, B. Chessman, 1 ♀. Lake Clarke, 23.x.1971, B. Chessman, 1 ♂. Lake Muirhead,



Figs. 14-17 *Sigara (Tropocorixa) australis* (Fieber) ♂, Adelaide: 14-16 tergites 6-8, 17, "strigil".

24.x.1971, B. Chessman, 4 ♀. Streatham, "Blythvale" Billabong, 24.iv.1971, J.K., 1 ♀. *Sigara (Tropocorixa) truncatipala* (Hale): New South Wales, Lagoon next to Lake Victoria, 8.iv.1971, J.K., 1 ♂. Queensland, Creek on Esk road near Ipswich Junction, 22.v.1971, J.K., 2 ♂.

*Sigara (Tropocorixa) sublaevifrons* (Hale): New South Wales, Lagoon next to Lake Victoria, 8.iv.1971, J.K., 1 ♂. Victoria, Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 23.iv.1971, J.K., 1 ♂. Little Lake next to Dam 25 km before Warrambine Creek, Hamilton road from Geelong, 25.iv.1971, J.K., 1 ♂, 1 ♀. Streatham, small Dam at "Blythvale", 24.iv.1971, J.K., 1 ♂, 1 ♀. Streatham, "Blythvale" river behind house, 24.iv.1971, J.K., 2 ♂, 11 ♀. Streatham, "Blythvale" Billabong, 24.iv.1971, J.K., 5 ♂, 21 ♀. Streatham, "Blythvale" water-tank Nixon,



Figs. 18-24 *Sigara* hind femora: 18, *australis* (Fieber). 19, *sublaevifrons* (Hale). 20, *truncatipala* (Hale). 21, *mullaka* Lansbury. 22, *tasmaniae* (Jaczewski). 23, *tadeuszi* (Lundblad). 24, *neboissi* Lansbury.

25.iv.1971, J.K., 1 ♂. Lake Purrumbete, Camperdown, 25.iv.1971, J.K., 2 ♀. Lake Muirhead, 24.x.1971, B. Chessman, 1 ♂, 1 ♀.

*Sigara (Tropocorixa) tasmaniae* (Jaczewski): South West Tasmania, Lake Pedder, 10.iii.1972, A. Neboiss, 3 ♂, 8 ♀ and 1 immature. Tasmanian endemic, previous records, Tas. National Park, 1,066 m (Type locality) and Shannon Lagoon.

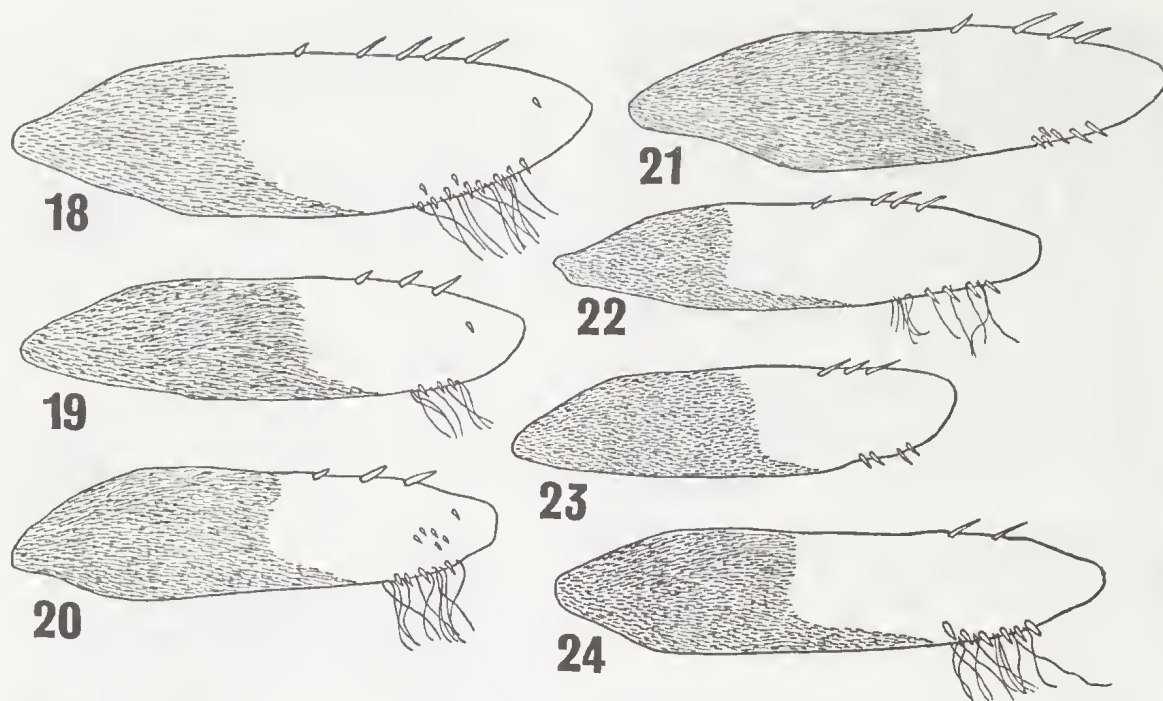
*Sigara (Tropocorixa) neboissi* Lansbury: North West Tasmania, Hellyer River Gorge, 9.ii.1971, A. Neboiss, 4 ♀. Tasmanian endemic, previous records, Shannon Lagoon; Hobart; Lake Tiberias and Ridgeway. This species is rather like *truncatipala* (Hale) which is widespread in South Australia, Victoria, New South Wales and parts of Queensland.

*Sigara (Tropocorixa) australis* (Fieber): Victoria, Lake Struan, 26.vi.1971, J.K., 13 ♂. Lake Linlithgow, 24.v.1971, B. Chessman, 19 ♂, 3 ♀. Lake Coleman, 19.vi.1971, B. Chessman, 7 ♂, 5 ♀. Lake Clarke, 23.x.1971,

B. Chessman, 1 ♂, 6 ♀; not typical, much paler than usual, black pronotal markings very narrow. Streatham, "Blythvale" river behind house, 24.iv.1971, J.K., 1 ♀. Dam near Lake Murdeduke, 26.vi.1971, J.K., 1 ♂, 2 ♀. Lake Muirhead, 24.x.1971, B. Chessman, 1 ♂, 5 ♀. Lake Terangpom, 25.iv.1971, J.K., 7 ♂, 6 ♀. Lake Coragulac, Alvie, 25.iv.1971, J.K., 3 ♂, 6 ♀. Lake Purrumbete, Camperdown, 25.iv.1971, J.K., 1 ♀. Lake Purdigulac, 17.v.1971, B. V. Timms, 4 ♂. Lake Rosine, 24.x.1971, B. Chessman, 2 ♂, 2 ♀. Gnarkeet Creek near Foxhow, 16.iv.1971, B. Chessman, 1 ♂, 1 ♀. Lake Colac, 13.iv.-18.vi.1971, B. V. Timms, 10 ♂, 10 ♀.

It can be inferred from the existing data that *australis* is characteristic of lakes and rivers and appears to be fairly common in Victoria. Lansbury (1970) figured the 8th tergite incorrectly, the three groups of hairs shown on this tergite were in fact groups which had become detached from the distal margin of the 7th tergite during the preparation of the slide. The correct appearance of the 6th-8th tergites are as shown in figures 14-16, the 'strigil' (Fig. 17). Specimens from Victoria, Lakes Muirhead; Terangpom; Coragulac; Clarke; Dam





Figs. 18-24 *Sigara* hind femora: 18, *australis* (Fieber). 19, *sublaevifrons* (Hale). 20, *truncatipala* (Hale). 21, *mullaka* Lansbury. 22, *tasmaniae* (Jaczewski). 23, *tadeuszi* (Lundblad). 24, *neboissi* Lansbury.

25.iv.1971, J.K., 1 ♂. Lake Purrumbete, Camperdown, 25.iv.1971, J.K., 2 ♀. Lake Muirhead, 24.x.1971, B. Chessman, 1 ♂, 1 ♀.

*Sigara (Tropocorixa) tasmaniae* (Jaczewski): South West Tasmania, Lake Pedder, 10.iii.1972, A. Neboiss, 3 ♂, 8 ♀ and 1 immature. Tasmanian endemic, previous records, Tas. National Park, 1,066 m (Type locality) and Shannon Lagoon.

*Sigara (Tropocorixa) neboissi* Lansbury: North West Tasmania, Hellyer River Gorge, 9.ii.1971, A. Neboiss, 4 ♀. Tasmanian endemic, previous records, Shannon Lagoon; Hobart; Lake Tiberias and Ridgeway. This species is rather like *truncatipala* (Hale) which is widespread in South Australia, Victoria, New South Wales and parts of Queensland.

*Sigara (Tropocorixa) australis* (Fieber): Victoria, Lake Struan, 26.vi.1971, J.K., 13 ♂. Lake Linlithgow, 24.v.1971, B. Chessman, 19 ♂, 3 ♀. Lake Coleman, 19.vi.1971, B. Chessman, 7 ♂, 5 ♀. Lake Clarke, 23.x.1971,

B. Chessman, 1 ♂, 6 ♀; not typical, much paler than usual, black pronotal markings very narrow. Streatham, "Blythvale" river behind house, 24.iv.1971, J.K., 1 ♀. Dam near Lake Murdeduke, 26.vi.1971, J.K., 1 ♂, 2 ♀. Lake Muirhead, 24.x.1971, B. Chessman, 1 ♂, 5 ♀. Lake Terangpom, 25.iv.1971, J.K., 7 ♂, 6 ♀. Lake Coragulac, Alvie, 25.iv.1971, J.K., 3 ♂, 6 ♀. Lake Purrumbete, Camperdown, 25.iv.1971, J.K., 1 ♀. Lake Purdigulac, 17.v.1971, B. V. Timms, 4 ♂. Lake Rosine, 24.x.1971, B. Chessman, 2 ♂, 2 ♀. Gnarkeet Creek near Foxhow, 16.iv.1971, B. Chessman, 1 ♂, 1 ♀. Lake Colac, 13.iv.-18.vi.1971, B. V. Timms, 10 ♂, 10 ♀.

It can be inferred from the existing data that *australis* is characteristic of lakes and rivers and appears to be fairly common in Victoria. Lansbury (1970) figured the 8th tergite incorrectly, the three groups of hairs shown on this tergite were in fact groups which had become detached from the distal margin of the 7th tergite during the preparation of the slide. The correct appearance of the 6th-8th tergites are as shown in figures 14-16, the 'strigil' (Fig. 17). Specimens from Victoria, Lakes Muirhead; Terangpom; Coragulac; Clarke; Dam

near Lake Murdeduke; Struan; Linlithgow; Coleman as well as material from South Australia, Adelaide, reed beds and Murray Bridge have been dissected to confirm the chaetotaxy of the tergites, none were found which resembled my 1970 figure. An error has been found in the first couplet of the 1970 key, the second line of the first couplet should read "Right clasper of male spine-like distally (figs. 54 and 67)" not figs. 97 and 98 as printed. The pilose areas of the hind femora of the Australian *Sigara* are of some additional help in separating some of the seven species although they are of no taxonomic value in distinguishing females of *truncatipala* from *sublaevifrons* which are often found in the same habitat.

An amended key is given which is based on Lansbury (1970) which includes references to the 1970 figures, these are in square brackets to distinguish them from the figures included in this paper.

#### Revised key to the Australian *Sigara*

- 1 Right clasper of male not spine-like distally [Figs. 13, 28 and 41] ..... 2
- Right clasper of male spine-like distally [Figs. 54 and 67] ..... 4
- 2 (1) Pala elongate, 3x longer than broad [Fig. 12]. Pilose area of hind femora not reaching half way along upper margin (Fig. 18) ... *australis* (Fieber)
- Pala shorter, never more than 2.75x longer than broad [Fig. 27] ..... 3
- 3 (2) Distal pala pegs much longer than remainder [Fig. 27]. Pilose area of hind femora reaching more than half way

along upper margin (Fig. 21)

..... *mullaka* Lansbury

Distal pala pegs not significantly longer than remainder [Fig. 40]. Pilose area of hind femora not reaching half way along upper margin (Fig. 22) .....

..... *tasmaniae* (Jaczewski)

- 4 (1) Frontal impression or fovea obsolete [Figs. 45 and 46] *sublaevifrons* (Hale)

— Frontal impression or fovea clearly defined [Figs. 58, 71 and 88] ..... 5

- 5 (4) At most 5.6 mm long, usually just over 5 mm ..... *tadeuszi* (Lundblad)

— At least 5.9 mm long ..... 6

- 6 (5) Distal pala margin concave, not produced along lower margin [Fig. 80]. Pilose area of hind femora reaching about half way along upper margin (Fig. 20) ..... *truncatipala* (Hale)

— Distal pala margin not concave, clearly produced along lower margin [Figs. 97 and 98]. Pilose area of hind femora not reaching half way along upper margin (Fig. 24) ..... *neboissi* Lansbury

#### References

- BROOKS, G. T., 1951. A revision of the genus *Anisops* (Notonectidae, Hemiptera). Kans. Univ. Sci. Bull. **34**(1): 301-519.
- LANSBURY, I., 1969. The genus *Anisops* in Australia (Hemiptera-Heteroptera, Notonectidae). J. nat. Hist. **3**: 433-458.
- , 1970. Revision of the Australian *Sigara* (Hemiptera-Heteroptera, Corixidae). J. nat. Hist. **4**: 39-54.
- , 1973. A review of the genus *Cercotmetus* Amyot and Serville, 1843 (Hemiptera-Heteroptera, Nepidae). Tijdschr. Ent. **116**(5): 83-106.
- , in press: Notes on the genus *Enithares* Spinola (Hemiptera-Heteroptera, Notonectidae). Ent. mon. Mag.

near Lake Murdeduke; Struan; Linlithgow; Coleman as well as material from South Australia, Adelaide, reed beds and Murray Bridge have been dissected to confirm the chaetotaxy of the tergites, none were found which resembled my 1970 figure. An error has been found in the first couplet of the 1970 key, the second line of the first couplet should read "Right clasper of male spine-like distally (figs. 54 and 67)" not figs. 97 and 98 as printed. The pilose areas of the hind femora of the Australian *Sigara* are of some additional help in separating some of the seven species although they are of no taxonomic value in distinguishing females of *truncatipala* from *sublaevifrons* which are often found in the same habitat.

An amended key is given which is based on Lansbury (1970) which includes references to the 1970 figures, these are in square brackets to distinguish them from the figures included in this paper.

#### Revised key to the Australian *Sigara*

- 1 Right clasper of male not spine-like distally [Figs. 13, 28 and 41] . . . . . 2
- Right clasper of male spine-like distally [Figs. 54 and 67] . . . . . 4
- 2 (1) Pala elongate, 3x longer than broad [Fig. 12]. Pilose area of hind femora not reaching half way along upper margin (Fig. 18) . . . *australis* (Fieber)
- Pala shorter, never more than 2.75x longer than broad [Fig. 27] . . . . . 3
- 3 (2) Distal pala pegs much longer than remainder [Fig. 27]. Pilose area of hind femora reaching more than half way

along upper margin (Fig. 21)

*mullaka* Lansbury

Distal pala pegs not significantly longer than remainder [Fig. 40]. Pilose area of hind femora not reaching half way along upper margin (Fig. 22) . . . . .

*tasmaniae* (Jaczewski)

4 (1) Frontal impression or fovea obsolete [Figs. 45 and 46] *sublaevifrons* (Hale)

— Frontal impression or fovea clearly defined [Figs. 58, 71 and 88] . . . . . 5

5 (4) At most 5.6 mm long, usually just over 5 mm . . . . . *tadeuszi* (Lundblad)

— At least 5.9 mm long . . . . . 6

6 (5) Distal pala margin concave, not produced along lower margin [Fig. 80]. Pilose area of hind femora reaching about half way along upper margin (Fig. 20) . . . . . *truncatipala* (Hale)

— Distal pala margin not concave, clearly produced along lower margin [Figs. 97 and 98]. Pilose area of hind femora not reaching half way along upper margin (Fig. 24) . . . *neboissi* Lansbury

#### References

- BROOKS, G. T., 1951. A revision of the genus *Anisops* (Notonectidae, Hemiptera). Kans. Univ. Sci. Bull. **34**(1): 301-519.
- LANSBURY, I., 1969. The genus *Anisops* in Australia (Hemiptera-Heteroptera, Notonectidae). J. nat. Hist. **3**: 433-458.
- , 1970. Revision of the Australian *Sigara* (Hemiptera-Heteroptera, Corixidae). J. nat. Hist. **4**: 39-54.
- , 1973. A review of the genus *Cercotmetus* Amyot and Serville, 1843 (Hemiptera-Heteroptera, Nepidae). Tijdschr. Ent. **116**(5): 83-106.
- , in press: Notes on the genus *Enithares* Spinola (Hemiptera-Heteroptera, Notonectidae). Ent. mon. Mag.